

Motorola

HOME RADIO

S E R V I C E M A N U A L

MODELS

53C1

53C2

5353

53C4

CHASSIS

HS-366

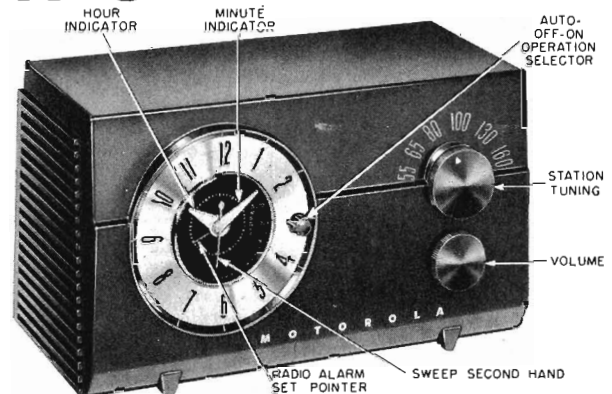
GENERAL INFORMATION

TYPE - AC table model superheterodyne receiver with plated circuit chassis and loop antenna. This receiver has a self-contained electric clock for automatically controlling the operation of the radio and the appliance outlet.

RECEIVER MODELS - Model	Color of Cabinet
53C1	Walnut
53C2	Ivory
53C3	Green
53C4	Red

TUNING RANGE - 535 Kc to 1620 Kc IF - 455 Kc

TUBE COMPLEMENT - Type	Function
12BE6	Converter
12BA6	IF Amplifier
12AT6	Det, AVC & AF Amp
50C5	Power Amplifier
35W4	Rectifier



POWER SUPPLY - Operates from 117 volt, 60 cycle, alternating current only. Power consumption 35 watts.

APPLIANCE OUTLET - For use with 117 volt AC appliances rated only at 1100 watts or less.

CLOCK - Telechron self-starting electric clock. See Service Notes for clock repair information.

INSTALLATION & OPERATING INSTRUCTIONS

The clock is self-starting and will operate when power cord is plugged into the power outlet. The sweep second hand will indicate when the clock is running. To set the hands on the clock to indicate the correct time, pull out AUTO-TIME SET knob (on rear of radio) and turn in a clockwise direction only. The self-starting feature, in the event of a temporary electric power interruption, will re-start the clock but it will be necessary to correct for time lost by means of the TIME SET knob.

Your Motorola is ready to operate when you plug it into any 117 volt, 60 cycle AC power line. Do not attempt to operate on DC as the clock motor will be damaged.

Radio reception can sometimes be improved by reversing the power plug in power outlet. Try it both ways and leave it in position giving best reception.

A built-in loop antenna eliminates the need for an outside antenna. The antenna is somewhat directional, therefore, when receiving weak stations, reception may sometimes be improved by rotating the receiver slightly in either direction.

The radio tuning dial scale is calibrated in kilocycles minus the last significant figure. A station listed at 800 kilocycles would be tuned in at 80, etc.

MANUAL RADIO OPERATION

1. Turn OPERATION SELECTOR knob to ON. Allow a short period of time for tube warm-up.
2. Tune to desired station with the STATION TUNING knob.
3. Adjust volume control to desired level.
4. The radio will play until OPERATION SELECTOR is turned to OFF.

AUTOMATIC CLOCK-RADIO OPERATION

1. Turn OPERATION SELECTOR knob to ON. Allow a short period of time for tube warm up.
2. Set the radio dial to the station you would like to hear at any pre-determined time, up to twelve hours in advance. Adjust volume to desired loudness.
3. Push in AUTO-TIME SET knob (on rear of radio) and turn in a clockwise direction until RADIO ALARM SET POINTER indicates the radio is to be turned on automatically.
4. Turn OPERATION SELECTOR to OFF and then to AUTO position. Leave it in AUTO position.
5. The radio is now set to turn on automatically at time indicated by RADIO ALARM SET POINTER. It will continue to play until OPERATION SELECTOR is turned to OFF.

LIST APPLICABLE BULLETINS & SUPPLEMENTS HERE:

MOTOROLA, INC. 4545 AUGUSTA BLVD. CHICAGO 51, ILLINOIS

APPLIANCE OPERATION

The APPLIANCE OUTLET is located on the rear of the set. Coffee-maker, heating pads, lamps, or any other electrical appliances which operate from 117V AC current and do not consume more than 1100 watts may be plugged into the APPLIANCE OUTLET. They will turn on automatically with the radio.

To turn on the appliance automatically at some predetermined time, follow the AUTOMATIC CLOCK-RADIO OPERATION instructions. The radio will also come on

with the appliance, serving as a reminder that the appliance has been turned on. If radio reception is not desired together with appliance operation, just turn VOLUME knob to minimum.

Appliances may also be operated manually, by following MANUAL RADIO OPERATION instructions. If radio reception is not desired with appliance operation, just turn VOLUME knob to minimum.

If radio is to be used alone, be sure to remove appliance plug from APPLIANCE OUTLET.

SERVICE NOTES

TO REMOVE RADIO CHASSIS FROM CABINET

1. Remove the four screws which hold the rear cover; disconnect the antenna and appliance outlet leads and remove the cover.
2. Pull off the two control knobs from the front of the cabinet.
3. Remove the Phillips head screw under the tuning knob on the front of the receiver.
4. Disconnect the chassis power leads from clock.
5. Disconnect speaker leads from chassis.
6. From the back, remove the three screws that mount the chassis to the cabinet.
7. Remove the chassis from the cabinet.

TO REMOVE CLOCK FROM CABINET

1. Remove the two speaker mounting screws and remove speaker.
2. Pull off the operation selector knob on front of cabinet.
3. Remove the four screws that hold the clock bracket to the cabinet.
4. Carefully remove the clock and clock bracket from the cabinet.
5. Unsolder leads and remove the two small nuts and washers mounting the clock to the clock bracket.

CLOCK REPAIR INFORMATION

Telechron timers can be repaired at Authorized Telechron Service Stations or at the Product Service Department, Telechron Department, Ashland, Mass. Consult your Motorola Distributor for the name of the nearest Telechron Service Station, or refer to the classified section of the telephone directory in large cities.

The timer should be removed from the radio cabinet and packed carefully in order that no further damage results in shipment.

An acknowledgement with a quotation and a request for payment will be sent to the dealer before the repair is made. The timer will be returned to the dealer on receipt of payment. If the timer is within warranty, repairs will be made on a no-charge basis.

CIRCUIT DESCRIPTION

1. The circuit of this chassis is conventional - there are no built-in resistors or capacitors. Leads are plated on both sides of the chassis base, thereby replacing the usual connecting wires and making wiring more uniform.
2. The metal plating extends through all the holes on the chassis, connecting circuits on the front with those on the rear.
3. Reference to the schematic diagram and to Figure 2 will permit the circuit to be traced easily.

SAFETY PRECAUTIONS

1. The chassis of this receiver is connected directly to the power line. However, the power cord circuit is broken by an interlock when the cabinet back is removed for replacing tubes. When aligning or servicing the chassis from AC, an isolation transformer should be inserted between the power line and the chassis.
2. Do not service the chassis on a metal plate, because of the possibility of a short circuit.
3. Use caution when handling the chassis with power applied, because all high voltage leads are exposed.
4. The outer edges of the chassis and the large plated areas in the center are at ground potential.

COMPONENT REPLACEMENT

1. To prevent tube breakage, remove them before replacing components. CAUTION: Remove the tubes only by pulling them straight out. Wiggling a tube may bend a socket clip, causing poor contact with the tube pin.

2. WHEN REMOVING DEFECTIVE COMPONENTS, USE ONLY A SMALL SOLDERING IRON (60 WATTS OR LESS) TO AVOID DAMAGE TO THE WIRING. DO NOT USE A SOLDERING GUN. WARNING: THE LEADS ARE VERY THIN, AND EXCESSIVE HEAT WILL BURN THEM OR LOOSEN THEM FROM THE BASE MATERIAL.

3. Plated connections or leads, if damaged, may be replaced with a jumper of regular hook-up wire.

4. It is recommended that IF transformers, tuning capacitor, volume control, oscillator coil, or the electrolytic capacitor be removed by immersing all the lugs simultaneously into a small soldering pot. The component may then be lifted off the chassis easily. If a soldering pot is not available, heat each lug individually with a small soldering iron, and shake off as much molten solder as possible. Then, by alternately heating and loosening each lug, the entire component will be freed. The disadvantage of using a soldering iron instead of a soldering pot is that the plated connections may be pulled loose from the chassis.

5. An individual tube clip may be removed by squeezing it with pliers and then unsoldering it. The new clip snaps into the hole.

6. Resistors or capacitors may be removed by unsoldering one end at a time.

CAUTION: Clean all the solder from the holes before installing a new component. Do not let the solder run onto an adjacent lead, as a short circuit will be created.

ALIGNMENT

NOTE: If AC power is used, insert an isolation transformer between the power line and the receiver to avoid hum and electrical shocks. If an isolation transformer is not available, connect the low side of the signal generator to ground (the outer edges of the chassis) through a .1 mf capacitor.

1. Connect a low range output meter across the speaker voice coil.
2. Connect the low side of the signal generator to ground.
3. Set the signal generator for 400 cycle, 30% modulation.
4. Turn the receiver volume control to maximum.
5. Use a small fibre screwdriver for aligning the IF transformers (a "K-Tran" alignment tool is recommended).
6. Adjust the signal generator output to produce .40 volts (.05 watt) across the voice coil. As stages are aligned, reduce the generator output (not receiver volume control) to maintain the .40 volt level, to avoid overloading the receiver.
7. See Figure 1 for adjustment locations and the following chart for procedure.

ALIGNMENT CHART

STEP	DUMMY ANTENNA	GENERATOR CONNECTION	GENERATOR FREQUENCY	GANG SETTING	ADJUST	REMARKS
IF ALIGNMENT						
1.	.1 mf	Grid of conv. (pin 7, 12BE6)	455 Kc	Fully open	1, 2, 3, & 4 (IF cores)	Adjust for maximum.
RF ALIGNMENT						
2.	.1 mf	Grid of conv. (pin 7, 12BE6)	1620 Kc	Fully open	5 (Osc)	Adjust for maximum.
3.	-	Radiation loop*	1400 Kc	Tune for max	6 (Ant)	Adjust for maximum.

*Connect generator output across 5" diameter, 5 turn loop and couple inductively to receiver loop. Keep loops at least 12" apart.

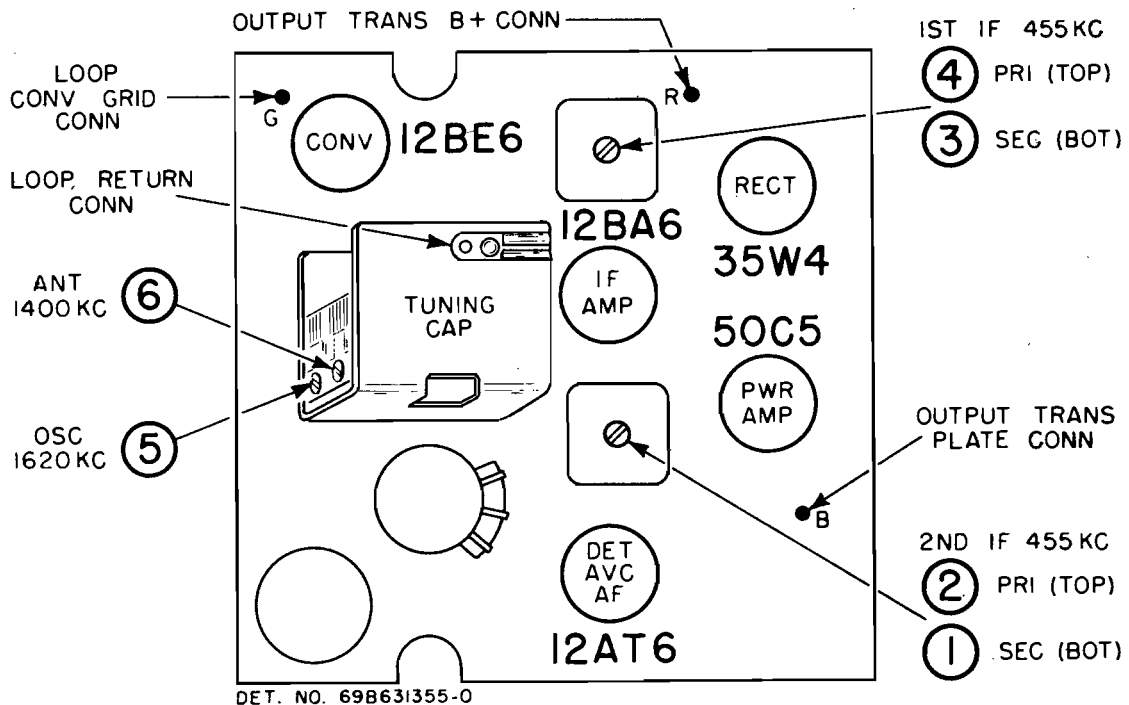


FIGURE 1. TUBE AND TRIMMER LOCATIONS

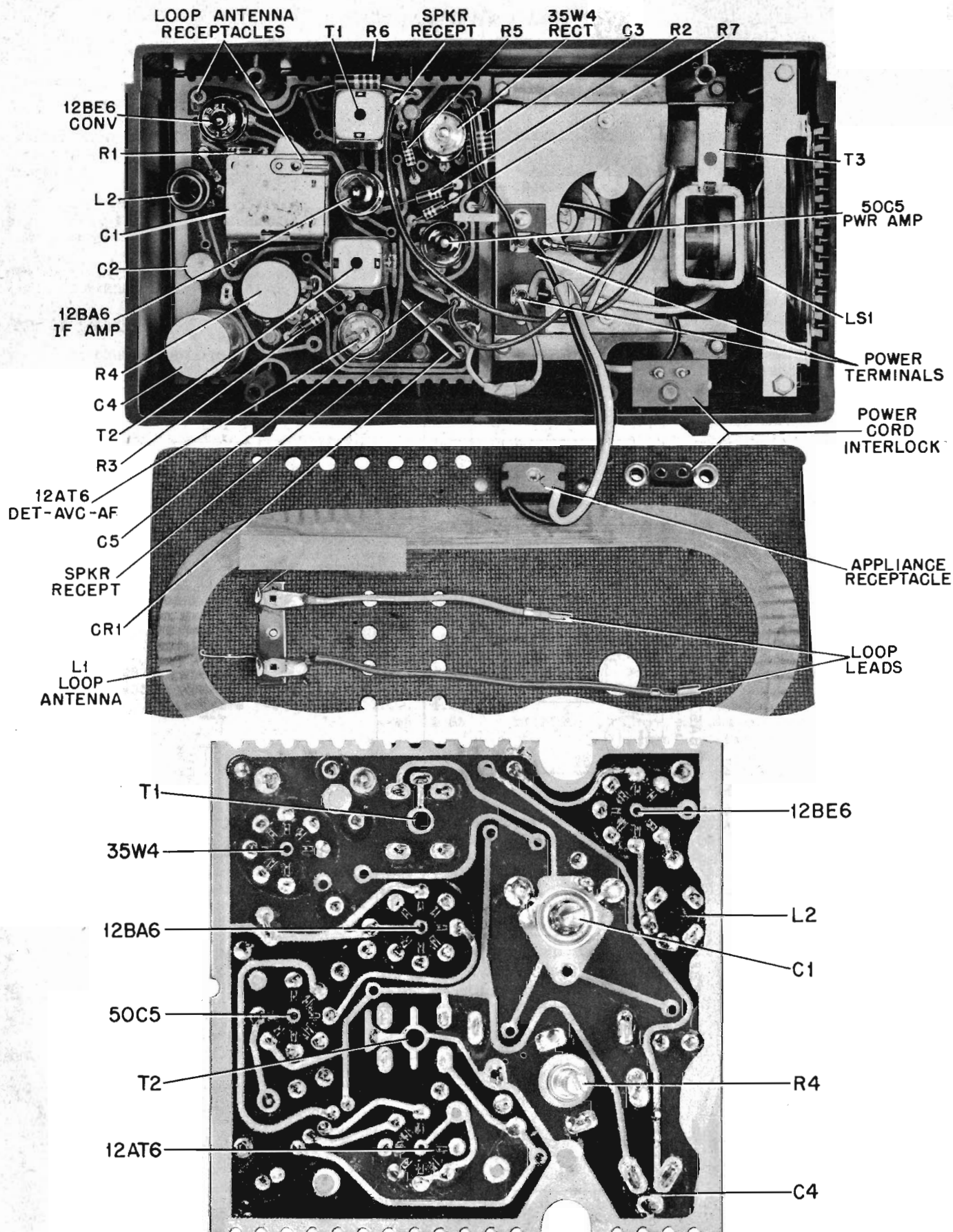


FIGURE 2. PARTS LOCATIONS



REPLACEMENT PARTS LIST

NOTE: When ordering parts, specify model number of set in addition to part number and description of part.

Ref. No.	Part Number	Description	List Price	Part Number	Description	List Price
CHASSIS PARTS - ELECTRICAL				CHASSIS PARTS - MECHANICAL		
<u>Capacitors</u>				42A610632	Clip, tube pin.....per/c	.50
C-1	19K630263	Variable, 2-gang.....	3.15	29A630230	Lug, terminal: AC connector....doz	.35
C-2	8A120842	Paper, tubular: .05 mf 200V..	.40	28A610679	Plug, line cord (interlock).....	.15
C-3	8K490232	Molded, paper: 47,000 mmf 400V.....	.30	29A631120	Terminal, pin (on speaker & antenna leads).....doz	.20
C-4	23B630155	Electrolytic 50-30 mf/150V..	1.95	CABINET PARTS		
C-5	21R120853	Ceramic, disc: .01 mf 450V..	.25	16E621760	Cabinet, table model: plastic; walnut; less clock crystal and dial scale (53C1).....	4.55
<u>Capacitor-Resistor</u>				16K621761	Cabinet, table model: plastic; ivory; less clock crystal and dial scale (53C2).....	5.50
CR-1	21B630180	Multiple Capacitor Resistor Plate.....	.85	16K621762	Cabinet, table model: plastic; green; less clock crystal and dial scale (53C3).....	5.50
<u>Clock</u>				16K621763	Cabinet, table model: plastic; red; less clock crystal and dial scale (53C4).....	5.50
E-1	59D630286	Electric Clock Assembly: Telechron. NOTE: SEE SERVICE NOTES FOR CLOCK REPAIR IN- FORMATION.....	--	30B630227	Cord, line: with plug & interlock receptacle.....	1.35
<u>Coils</u>				61A622114	Crystal, plastic (clock face cover)	.15
L-1	1V630377	Antenna Loop & Back Cover Assembly: includes AC re- ceptacle & line cord.....	3.70	36B630870	Knob, operation selector: black...	.05
L-2	24B630327	Oscillator coil.....	.85	36B622111	Knob, tuning: black.....	.25
<u>Speaker</u>				36B622107	Knob, volume: black.....	.15
LS-1	50C630287	Speaker: 4" PM; 3.2 ohm VC; includes T-3.....	4.70* exch 3.55	1V630275	Receptacle, appliance: with lugs (on loop panel).....	.35
or	50C631455			34K630278	Scale, clock dial.....	.60
<u>Resistors</u>				3S115138	Screw, machine: 6-32 x 1-9/16 Phillips flat head; cad pl (chassis mtg - through front of cabinet).....doz	.20
Note: All resistors are insulated carbon type unless otherwise specified.				3S121050	Screw, thread-cutting: #6 x 1/2 plain hex head; cad pl (chassis and speaker mtg).....doz	.25
R-1	6K119405	22,000 20% 1/2W.....doz	1.20	3S7480	Screw, thread-cutting: #6 x 5/16 plain hex head; cad pl (clock mtg).....doz	.25
R-2	6K119402	100 20% 1/2Wdoz	1.20	15A630871	Shell, appliance receptacle mtg...	.05
R-3	6K119407	3.3 meg 20% 1/2W.....doz	1.20	31A630229	Terminal Strip (AC connector on clock mtg brkt).....	.10
R-4	18A630279	Volume control: 1 meg; with- out switch.....	.98	29A620057	Terminal, pin (on antenna loop leads).....doz	.25
R-5	6K119401	27 10% 1/2W.....doz	1.20			
R-6	6K121276	1000 20% 2W.....	.20			
R-7	6K119403	150 20% 1/2W.....doz	1.20			
<u>Transformers</u>						
T-1	24C630284	1st IF transformer: 455 Kc; complete.....	1.65			
T-2	24K630898	2nd IF transformer: 455 Kc; complete.....	1.65			
T-3	25B630280	Output transformer.....	1.00			

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

*Plus Federal Excise Tax At Current Rate